510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
ASSAY ONLY TEMPLATE

A. 510(k) Number:

K060088

B. Purpose for Submission:

To add Ampicillin to the MicroScan® Synergies plus™ Gram-Positive MIC/Combo Panels

C. Measurand:

Ampicillin at 0.12-64 µg/mL or 2-8 µg/mL

D. Type of Test:

Quantitative and Qualitative growth based detection algorithm using optics light detection

E. Applicant:

Dade Behring Inc,
MicroScan®

F. Proprietary and Established Names:

MicroScan® Synergies plus™ Gram-Positive MIC/Combo Panels

G. Regulatory Information:

1. Regulation section:

   866.1645 - Fully automated short-term incubation cycle antimicrobial susceptibility system
   866.1640 - Antimicrobial Susceptibility Test Powder

2. Classification:

   Class II

1. Product code:
   LON – Automated AST system short incubation

LRG-Instrument for Auto Reader & Interpretation of Overnight Antimicrobial Susceptibility Systems
JWY - Manual Antimicrobial Susceptibility Test Systems
LTT – Panels, Test, Susceptibility, Antimicrobial

4. Panel:
   83 Microbiology

H. Intended Use:

1. Intended use(s):

   Ampicillin at concentrations of 0.12-64 µg/mL on the MicroScan® Synergies plus ™ Gram-Positive MIC/Combo Panel is intended for use with MicroScan® Synergies plus™ Panels read on the WalkAway® -SI System (including upgraded WalkAway® -40 or WalkAway® -96 to meet WalkAway® SI equivalence). MicroScan® panels are designed for use in determining identification to the species level of colonies, grown on solid media, of rapidly growing aerobic and facultative anaerobic gram-positive cocci and Listeria; the panels also provide quantitative and/or qualitative antimicrobial agent susceptibility for *Staphylococci* and *Enterococci*.

2. Indication(s) for use:
   The testing of Ampicillin at concentrations of 0.12-64µg/mL or 6-8 µg/mL (Breakpoint Dilution Sequence) on the gram-positive test panel for testing *Enterococcus* spp. at 4.5-18 hours for either an earlier reading or an overnight reading

3. Special conditions for use statement(s):
   - Turbidity method of inoculum preparation only.
   - For prescription use only.

4. Special instrument requirements:

   Not Applicable

I. Device Description:

Each panel contains two control wells: a negative control well, and a growth control well (contains test medium without antibiotic). Antibiotics are diluted in water, buffer, or minute concentrations of broth to selected concentrations prior to dehydration of the panels. The panel is rehydrated and inoculated at the same time with 0.1 ml of suspension prepared by the turbidity method (inoculum prepared in 0.4% saline with PLURONIC®, then 0.1ml transferred to 25ml of inoculum Synergies plus Pos Broth with PLURONIC®) for a final inoculum concentration of 3-7 X 10^5 CFU/ml. Panels are incubated in a Walk-Away® System and read

periodically starting at 4.5 hours until sufficient growth to determine the MIC. Alternately the panels may be incubated at 35° C in a non-CO_2 for 16-24 hours and read by visual observation of growth.

J. Substantial Equivalence Information:

1. Predicate device name(s):

   MicroScan® Dried Gram-Positive and Gram-Negative MIC/Combo Panels

2. Predicate 510(k) number(s):

   k862140
   k020185

3. Comparison with predicate:

Similarities		
Item	**Device**	**Predicate**
Intended use	MicroScan® panels are designed for use in determining quantitative and/or qualitative antimicrobial agent susceptibility and/or identification to the species level of colonies, grown on solid media, of rapidly growing aerobic and facultative anaerobic organisms	Same
Specimen	Isolated colonies from culture used	Same
Inoculum	Inoculum density to 0.5 McFarland standard	Same
Incubation	<16 hours;16 – 20 hours	Same
Results	Quantitative with qualitative interpretations	Same
Technology	Growth based	Same

Differences		
Item	**Device**	**Predicate**
Panels	Dried in water	Dried clindamycin or gentamicin in broth
Reading	Uses both an early and overnight read algorithm in the same system	Overnight system uses only the overnight reading methods and <16 hour instruments use only the <16 hour read methods.
Inoculum preparation	Turbidity method of inoculation only.	Inoculum prepared from isolated colonies using either the Turbidity method or Prompt® system
Instrument	WalkAway® -SI System or equivalent	autoScan® -4 or WalkAway®
Antibiotic	Ampicillin at 0.12-64 µg/mL and 2-8µg/mL	Different concentrations depending on the antibiotic

K. Standard/Guidance Document Referenced (if applicable):

Class II Special Controls Guidance Document: Antimicrobial Susceptibility Test (AST) Systems; Guidance for Industry and FDA"; Clinical and Laboratory Standards Institute (CLSI) M7 (M100-S16) "Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria That Grow Aerobically; Approved Standard".

L. Test Principle:

The WalkAway® SI uses a Colorimetric Optics System consisting of a color wheel/lamp assembly and a Photosensor. There is an initial read at 2.5 hours with a possible final read at 4.5, 5.5, 6.5, 8, 12, 16, or 18 hours (overnight instrument readings, manual readings) depending on the growth rate of the organism being tested. The time of final read is dependent on the growth rate of the organism and the sensitivity of the automatic reader since cell densities below 2×10^7 cells/ml are not detected.

M. Performance Characteristics (if/when applicable):

1. Analytical performance:

a. Precision/Reproducibility:

Reproducibility was demonstrated using 10 isolates tested at 3 sites on 3 separate days in triplicate. The study included the testing on the WalkAway® SI read at <16 hours, WalkAway® 16-18 hour readings and manual readings at 16-20 hours incubation. The WalkAway® SI had 9 results that were not readable at <16 hours for a no growth rate of 3%. Results were >95% reproducible for all read methods.

Breakpoint readings were performed on the same 10 Enterococci isolates with reproducibility based on a category reading. Less than 16 hour readings resulted in ≥ 95% reproducibility with 3% no growth at <16 hour. Overnight readings performed on the same panels for the WalkAway® 16-18 hour readings and manual readings at 16-20 hours incubation were also ≥ 95% reproducible with no isolates that did not grow.

b. Linearity/assay reportable range:

Not Applicable

c. Traceability, Stability, Expected values (controls, calibrators, or methods):

The recommended Quality Control isolate was tested a sufficient number of times with acceptable results on all testing days with the reference method. All results grew in the 4.5-16 hour window. Quality control results demonstrated the ability of the different reading parameters (manual and

instrument) to produce acceptable results. The following table provides the frequency of the results in each concentration with the expected range stated.

			Results		
Organism	Conc. in µg/mL	# reference	MicroScan®		
			Manual overnight	WalkAway® overnight	4.5-15h WalkAway® SI
E. faecalis ATCC 29212 Range 0.5-2 µg/mL	≤ 0.12				
	0.25				
	0.5	31	3		
	1	53	80	84	84
	2		1		
	4				

The breakpoint panels using a separate reading algorithm also demonstrated acceptable quality control results with all at ≤ 2 µg/mL.

Inoculum density control: A turbidity meter was used for the turbidity inoculation method.

d. Detection limit:

Not Applicable

e. Analytical specificity:

Not Applicable

f. Assay cut-off:

Not Applicable

2. Comparison studies:

a. Method comparison with predicate device:
Clinical testing was conducted at 3 sites using fresh isolates supplemented with stock isolates. A total of 306 *Enterococci* spp. were tested of which 213 were fresh isolates. There were 75 challenge isolates tested at one site and compared to the reference broth dilution result mode that was determined by previous testing of each isolate multiple times in the recommended reference panel. The Synergies plus™ results were obtained at read times between 4.5 and 15 hours of incubation for >95% of the results. An additional comparison was done with readings on the instrument after overnight incubation and also read manually when incubated 16- 18 hours. Performance by these alternate reading methods was also acceptable with no apparent differences or trends.

Comparison was made to the recommended CLSI reference method which was followed with the exception of the use of a small amount (0.1%) PLURONIC® in the final inoculum. A validation of the use of PLURONIC® in the frozen reference panels was conducted. Similar calculations for the different reading methods were performed with very little difference. The chart below demonstrates the performance of Synergies plus™ readings at <16 hours when compared to the reference method.

	total	**EA**	**%EA**	**Total evaluable**	**EA of evaluable**	**%EA**	**CA**	**%CA**	**#R**	**maj**	**vmj**
Clinical	293	287	98.0%	232	226	97.4%	293	100%	82	0	0
Challenge	72	70	97.2%	62	60	96.8	71	98.6%	29	0	1
Combined	365	357	97.8%	294	286	97.3%	364	99.7%	111	0	1

EA-Essential Agreement **maj**-major discrepancies
CA-Category Agreement **vmj**-very major discrepancies
R-resistant isolates

Evaluable results are those that fall within the test range of the reference method and could also be on-scale with the new device if within the plus/minus one dilution variability. EA is when there is agreement between the reference method and the MicroScan® within plus or minus one serial two-fold dilution of antibiotic. CA is when the interpretation of the reference method agrees exactly with the interpretation of the MicroScan® result.

Similar results were obtained when the algorithm for reading a breakpoint panel with 2, 4 and 8 µg/mL wells with no difference in CA. EA was not calculated for these readings since insufficient numbers of concentrations were available for the evaluation.

b. Matrix comparison:

Not Applicable

3. Clinical studies:

a. Clinical Sensitivity:

Not Applicable

*b. Clinical specificity**:***

Not Applicable

c. Other clinical supportive data (when a. and b. are not applicable):

Not Applicable

4. Clinical cut-off**:**

   Not Applicable

5. Expected values/Reference range:

   Enterococcus spp. interpretive criteria: ≤ 8 (S) and ≥ 16 (R)

   All values are included in the package insert as is the quality control strain with recommended ranges.

N. Proposed Labeling:

The labeling is sufficient and it satisfies the requirements of 21 CFR Part 809.10.

O. Conclusion:

The submitted information in this premarket notification is complete and supports a substantial equivalence decision.